IN THE CLAIMS

We claim:

1. A photoacid generator, comprising:

an antenna group; and

a carborane-based group.

2. The photoacid generator of claim 1, wherein the carborane-based group is halogenated by between one and six halogens.

3. The photoacid generator of claim 2, wherein the carborane-based group is hexachlorocarborane.

4. The photoacid generator of claim 1, wherein the carborane-based group is functionalized on at least one boron atom by a group having a high electronegativity.

5. The photoacid generator of claim 1, wherein the carborane-based group is functionalized by an etch-resistant group.

6. The photoacid generator of claim 1, wherein the carborane-based group is functionalized on a boron atom by an alkyl group.

7. The photoacid generator of claim 1, wherein the carborane-based group is functionalized on a carbon atom by a group that modifies the polarity of the cationic carborane.

8. The photoacid generator of claim 1, wherein the antenna group is diphenyliodonium.

9. A composition, comprising:

a photoacid generator moiety comprising a carborane;

a photoimageable species; and

a quencher.

10. The composition of claim 9, wherein the composition is formulated to serve as a 193nm photoresist.

11. The composition of claim 9, wherein the composition is formulated to serve as an EUV photoresist.

12. The composition of claim 9, wherein the EUV photoresist is sensitive to light having a wavelength of 13.5nm.

13. A composition, comprising:

a photoacid generator moiety comprising a carborane;

a photoimageable species;

a quencher; and

the reaction products thereof.

14. The composition of claim 13, further comprising an additive.

15. The composition of claim 14, wherein the additive is in the approximate range of 0.1 – 5% by weight of the composition.

16. The composition of claim 13, further comprising a solvent.

17. The composition of claim 16, wherein the solvent is in the approximate range of 1% - 5% by weight of the composition.

18. The composition of claim 13, wherein the photoacid generator moiety comprising a carborane is in the approximate range of 0.1% and 5% by weight of the composition.

19. The composition of claim 13, wherein the photoacid generator moiety comprising a carborane is in the approximate range of 0.5% and 2.5% by weight of the composition.

20. The composition of claim 13, wherein the photoimageable species is a polymer.

21. The composition of claim 13, wherein the photoimageable species is in the approximate range of 80% and 97% by weight of the composition.

22. A method comprising:

improving the resolution of a photoresist by using a large volumed photoacid generator that produces a superacid when irradiated.

23. The method of claim 22, wherein the superacid is approximately four orders of magnitude more acidic than sulfuric acid.

24. The method of claim 22, wherein the large volumed photoacid generator is spherical-shaped.

25. A method comprising:

applying a photoresist to a substrate, the photoresist comprising a carborane-based photoacid generator;

patterning the photoresist by irradiating the photoresist; and

etching the substrate.

26. The method of claim 25, wherein applying a photoresist to the substrate comprises applying a chemically amplified photoresist to the substrate.

27. The method of claim 26, wherein the chemically amplified resist is a high activation energy resist.

28. The method of claim 25, wherein patterning the photoresist by irradiating the photoresist comprises exposing the photoresist to light having a wavelength of 193nm.

29. The method of claim 25, wherein patterning the photoresist by irradiating the photoresist comprises exposing the photoresist to light having a wavelength in the extreme ultraviolet region of the spectrum.

30. The method of claim 29, wherein the wavelength in the extreme ultraviolet region of the spectrum is 13.5nm.